REMARKS

In view of the foregoing amendments and the following remarks, Applicants respectfully request reexamination of the present application. Claim 1 has been amended to correct a minor error, no claims have been cancelled and no new claims have been added. Claims 1, 3, 5, 10-12, 25, 26, 143, 146, 153, 155-157 and 160 remain pending.

Summary of the Present Invention

The present invention relates to methods for adjusting the atmosphere within a substantially sealed chamber containing respiring produce.

According to the present invention, the carbon dioxide (CO_2) concentration can be controlled ***at a desired level*** without monitoring the carbon dioxide by way of continuous removal of carbon dioxide at a ***predetermined rate***. The present invention represents a marked simplification of approaches used in the prior art, and arises out of the inventors' surprising realization that a suitable controlled atmosphere for storage/transport of perishables with independent control of both oxygen and CO_2 can be created and maintained ***without*** the need for complex monitoring of all variables, including the CO_2 level.

Outstanding Claim Rejections

The Examiner has maintained the rejection of every pending claim under 35 U.S.C. 103(a) as being unpatentable over WO 91/15719 by Huston in view of EP 353021 by Samuel, WO 95/05753 by Bishop, JP 2-82083 by Fukuda and EP 136042 by Lovegrove et al., further in view of U.S. Patent No. 4,079,152 by Bedrosian et al., for the reasons detailed in the Office Actions mailed on 03/14/03, 09/05/03 and 03/29/04.

The Examiner's position is that Huston discloses a method of adjusting the atmosphere within a sealed chamber containing respiring product, where the chamber includes: inlet means that can be opened to admit ambient atmosphere so that the amount of oxygen is increased when the oxygen concentration falls below a predetermined value; and outlet means to permit chamber atmosphere to exit so that carbon dioxide does not exceed a predetermined amount. The Examiner claims that Huston does this for the same

reason as Applicants, namely, to provide an atmosphere for respiring produce that is low in oxygen and relatively high in carbon dioxide to slow down respiration and extend the life of the produce. The references to Samuel, Bishop, Fukuda and Lovegrove et al. were relied upon as further evidence of monitoring gas chamber concentrations for respiring produce.

With respect to Claim 3, the Examiner stated that the art taken as a whole provides a controlled gas atmosphere for slowing respiration of produce, and that Huston establishes a preprogrammed control system for doing this. The objective is the same and whether calculated from a formula or not, is seen to have been an obvious computation since the art taken as a whole is well aware that respiration rates, gas concentrations, temperatures, etc. are all interrelated variables. Thus, such a calculation would appear to be inherent in Huston, or obviously derivable therefrom. With respect to claim five, the examiner stated that this claim basically recites a rate that is similar to one achieved by a formula. The Examiner notes that the formula is not recited as actually being used to manipulate any variable, only that the result would be similar to a result obtained by a formula.

With regard to Claims 10 -12, the Examiner stated that Huston teaches using a carbon dioxide absorbing material to remove carbon dioxide, but that it is not clear if Huston utilizes a carbon dioxide pervious container. In any case, the Examiner reasoned that Lovegrove et al. teach the conventionality of providing the carbon dioxide absorbing material in a carbon dioxide pervious bag, and to modify Huston and employ a conventionally produced container for the absorbing material for its art-recognized and Applicants' intended function would therefore have been obvious. The Examiner states that the previousness of the bag would inherently have to be at the rates recited for the method to reduce the carbon dioxide concentration. (Office Action of March 14, 2003, paper No. 9).

In response to Applicants' amendments and arguments, including that the carbon dioxide level is not monitored in the present invention, the Examiner asserted that Lovegrove et al. discloses that "preferably" the carbon dioxide level is also monitored and therefore Lovegrove et al. discloses that carbon dioxide can be eliminated *without* carbon dioxide monitoring. That is, the Examiner asserted that Lovegrove et al. teaches that

carbon dioxide monitoring is preferred, but not critical (Office Action of September 5, 2003, paper No. 11).

In response to Applicant's further amendments and arguments, including that a non-zero carbon dioxide concentration is maintained in the container, the Examiner rejected the claims in view of the foregoing references, and further in view of Bedrosian et al. The Examiner cited Bedrosian et al. for the proposition that it is conventional in the art to provide a method of adjusting the atmosphere within an enclosed chamber containing respiring produce where not only is the atmosphere within the chamber maintained at preset values, but without monitoring the carbon dioxide concentration within the chamber. The Examiner concluded that to modify the combination and provide the step of removing carbon dioxide to a predetermined level without monitoring the carbon dioxide concentration would therefore have been obvious in view of the art as a whole. (Office Action of March 29, 2004, page 3).

In response to Applicants' most recent submission of February 10, 2005, the Examiner states that the Declaration under 37 C.F.R. 1.132, and the remarks accompanying the response have been fully and carefully considered but are not seen to be sufficient to overcome the *prima facie* case of obviousness. The Examiner states that the Declaration sets forth an opinion and fails to set forth facts. The Examiner also states that in each case, the Declarant states that, in his opinion, the skilled person in the art would have understood that if CO_2 levels were to be controlled then CO_2 levels would have to be monitored or that, in his opinion, it would not have been possible to take the teaching of Bedrosian and apply it to the other references. The Examiner questions what facts support this opinion.

The Examiner further states that Bedrosian et al. controls the atmosphere within the package and that Bedrosian et al. controls the atmosphere within the package by using a film of selected permeability. Thus, the Examiner reasons that although the technique is different, the atmosphere in both cases is controlled. The Examiner also states that Bedrosian et al., like the other references applied, and like applicant as well, would have determined the amount of gas concentration through calculations that are known functions of temperature, time, weight of product, respiration rates, etc. Bedrosian therefore

determined the gas concentrations but determined to insure an even further reduced CO_2 concentration for the same reason applicant does - to prevent CO_2 damage to the produce. Thus, the Examiner states, Bedrosian employs the CO_2 absorbent for the same reason as applicant.

The Examiner also states that to know how much CO_2 absorbent to add to the package to achieve the result desired, Bedrosian et al. would have had to manipulate the same known variables. The Examiner states that the art taken as a whole teaches that one should reduce and monitor O_2 levels since it is the O_2 that is consumed by the produce and which is most effective in retarding the aging of the produce, and that the CO_2 levels are preferably, but not necessarily, monitored. The Examiner also states that, presumably, when the art monitors the CO_2 level it is to insure the levels are not injurious. The Examiner states that Bedrosian et al. teaches that CO_2 absorbers can control such a potential problem and therefore, since Bedrosian et al. teaches that one can add a CO_2 absorber to an enclosure to prevent excessive levels of CO_2 without the need to add a conventional CO_2 controller, *the art taken as a whole fairly teaches that it would have been obvious to add the CO_2 absorber to the combination to maintain a non-injurious level of CO_2 without the need to add a conventional CO_2 monitor.* The Examiner also notes that Bedrosian et al. does not have to disclose the particular physical environment, since that is already taught to be conventional by the other art applied. The Examiner further notes that the result appears to be an expected result not an unexpected result. The Examiner states that in view of Bedrosian et al., one would expect to be able to maintain a desired, non-injurious level of CO_2 without a monitoring system.

Applicants respectfully traverse these rejections.

1. The Examiner has not established any suggestion, teaching or motivation to combine the references.

When obviousness is based on the teachings of multiple prior art references, there must be some "suggestion, teaching, or motivation" that would have led a person of ordinary skill in the art to combine the relevant prior art teachings in the manner claimed. *Tec Air, Inc. v. Denso Mfg. Mich. Inc.,* 192 F.3d 1353, 1359-60 (Fed. Cir. 1999). The

reason, suggestion or motivation to combine the prior art references may be found explicitly or implicitly: 1) in the prior art references themselves; 2) in the knowledge of those of ordinary skill in the art that certain references, or disclosures in those references, are of special interest or importance in the field; or 3) from the nature of the problem to be solved, "leading inventors to look to references relating to possible solutions to that problem." *Ruiz v. A.B. Chance Co.,* 234 F.3d 654, 665 (Fed. Cir. 2000). The Examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination *in the manner claimed.* (Emphasis added) *In re Rouffet,* 149 F.3d 1350,1357 (Fed. Cir. 1998).

Huston and the other references cited by the Examiner, with the exception of Bedrosian et al., relate to relatively complex shipping containers for the long-distance shipping of produce. These containers can include refrigeration units and means for monitoring and controlling the atmosphere within the shipping containers. The present invention addresses a problem in this industry, namely the desire to control atmospheric conditions within the container while reducing the complexity of the equipment required to do so.

In contrast, Bedrosian et al. describes a thin-film package that achieves a desired equilibrium by way of a differential permeability of O_2 and CO_2 in and out of the package. Once the thin-film package is sealed there is no monitoring and no further active control over the atmosphere of the packaging.

In the previously submitted Rule 132 Declaration, inventor Savur of the present invention states that the approach of Bedrosian et al. is wholly unrelated to that of the present invention. This opinion is also clearly recognized by the prior art of Lovegrove et al. As is noted by Lovegrove et al.:

> Many countries because of their geographical position are in an unenviable position owing to the large distance over which comestibles must be shipped and *many of the answers that deal with the shorter passages*

involved in freighting, for example, fruit and/or vegetables are not always appropriate. (Lovegrove et al., page 1, lines 5-9, emphasis added).

The sworn statement of the inventor of the present invention and the disclosure of Lovegrove et al. clearly demonstrate that a skilled artisan confronted with the same problems of the current inventor would not be motivated to select elements from the Bedrosian et al. reference for combination in the manner presently claimed. Therefore, Applicants respectfully submit that Bedrosian et al. is not properly combinable with the remaining references and removal of these rejections on this basis is requested.

2. Even if properly combined, the references do not teach every element of the present invention.

To establish *prima facie* obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. *In re Wilson*, 424 F.2d 1382 (CCPA 1970). Furthermore, when the art in question is relatively simple, the opportunity to judge by hindsight is particularly tempting. Consequently, the test of whether to combine references need to be applied rigorously. *McGinley v. Franklin Sports, Inc.,* 262 F.3d 1339, 1351, 60 USPQ 2d 1001 (Fed. Cir. 2001). The simplicity of new inventions is often times the very thing that is not obvious before they are made. *In re Sporck,* 301 F.2d, 686, 133 USPQ 363 (CCPA 1962).

As is discussed above, the present invention can be viewed as a simplification of approaches used in the prior art of long distance shipping containers, in that it has been found that a suitable controlled atmosphere for the storage and transport of perishables with independent control of both oxygen and CO_2 can be created and maintained without the need for complex monitoring of all variables, including the CO_2 level. This is in contrast to the cited prior art references relating to such shipping containers which require more complex mechanisms for the monitoring and removal of carbon dioxide.

Each independent claim recites monitoring and controlling oxygen in a sealed chamber, establishing that the present invention is directed to sealed containers of reasonable capacity and complexity (i.e., as compared to Bedrosian et al.). Independent

Claim 1 recites that the carbon dioxide within the sealed chamber is: 1) continuously removed; 2) without monitoring of the carbon dioxide concentration; 3) at a predetermined removal rate, where the rate is selected such that a non-zero carbon dioxide concentration is maintained in the chamber and it does not substantially exceed a predetermined level and where the carbon dioxide concentration is within a pre-determined range during the storage time.

Bedrosian et al. merely suggests that some quantity of carbon dioxide adsorbent can be placed in a thin-film package environment in an amount sufficient to keep the carbon dioxide level of that environment below 2.5%. Bedrosian et al. further suggests a range of 2 to 20 grams of hydrated lime *per pound* of tomatoes to maintain the carbon dioxide level for up to 14 days at room temperature. (Col. 3, lines 43-53) Further insight is provided by Bedrosian et al. in Example 6, wherein it is disclosed that lime was added to tomato packaging and that the carbon dioxide level in the pouches with lime did not exceed 1.1%, as compared to pouches that did not contain lime where the carbon dioxide levels were from 4.3 to 7.5% (Col. 6, lines 19-24).

Bedrosian et al. does not suggest removing the carbon dioxide from the chamber atmosphere *at a predetermined removal rate*, where the predetermined removal rate is such that a *non-zero carbon dioxide concentration* is maintained within the chamber atmosphere to maintain the carbon dioxide concentration within a predetermined desired range. It is evident from Bedrosian et al. that they do not contemplate the continuous removal of carbon dioxide from a container such that: 1) a non-zero carbon dioxide carbon dioxide concentration is maintained; and 2) carbon dioxide concentration is maintained within a predetermined range during the storage time. Bedrosian et al. is attempting to remove as much carbon dioxide as possible, without regard to any desired range and without regard to attempting to maintain a non-zero quantity of carbon dioxide. This is evidenced by the disclosure of Bedrosian et al. that 2 to 20 grams (i.e., a range of an *order of magnitude*) per pound of tomatoes can be used.

The Examiner states that Bedrosian et al. employs the CO_2 adsorbent for the same reason as Applicant, namely to prevent CO_2 damage to the produce. However, this is not the case. Bedrosian et al. employs CO_2 adsorbent to remove as much CO_2 as possible

from the packaging. The present invention utilizes a carefully selected amount of CO_2 adsorbent to maintain a desired *range* of CO_2 within a container.

The Examiner also states that to know how much CO_2 adsorbent to add to the package to achieve the result desired, Bedrosian et al. would have had to manipulate the same known variables. While it may be true that Bedrosian et al. could have manipulated such variables, the fact is that Bedrosian et al. *does not* manipulate any known variables and *does not* place any significance on the amount of CO_2 adsorbent added to the packaging.

The Examiner states that the art taken as a whole teaches that the CO_2 levels are preferably, but not necessarily monitored. Again, this is not the case. Clearly, monitoring CO_2 levels in small packaging (e.g., for retail sale), such as that disclosed by Bedrosian et al., would be impracticable. However, the cited art related to shipping containers *clearly* demonstrate a belief that CO_2 levels must be monitored to be controlled. For example, Lovegrove et al., previously cited by the Examiner in this respect, discloses that the CO_2 is not necessarily monitored. However, Lovegrove et al. clearly teaches that *if* the CO_2 level is to be controlled, *then* the monitoring step is necessary. That is, what Lovegrove et al. teaches is that CO_2 control and *therefore* CO_2 monitoring, is optional.

Claim 3 depends upon Claim 1 and recites that the predetermined carbon dioxide removal rate is calculated from a formula. Again, Bedrosian et al. clearly does not contemplate the use of any means for calculating the amount of carbon dioxide adsorbent to place within the packaging. This is evident by the wide range of suggested levels of adsorbent placed in the packaging on a *per pound* basis of produce.

Claim 5 is dependent upon Claim 3 and recites a specific formula that can be utilized to calculate the carbon dioxide removal rate that is necessary. This formula takes into account a number of factors, including the desired carbon dioxide concentration within the chamber and the amount of oxygen and carbon dioxide produced by the produce through respiration. Bedrosian et al. does not consider *any* of these factors in determining the amount of carbon dioxide adsorbent to place within the packaging.

Each of dependent Claims 10, 11 and 12 recite that the carbon dioxide absorbing material is contained within a transmissible container that is selected *so that the rate of carbon dioxide transmission into the carbon dioxide transmissible container is substantially equal to the predetermined carbon dioxide removal rate.* There is absolutely no evidence on the record that Bedrosian et al., or any of the references, select a carbon dioxide transmissible container such that the *rate* of carbon dioxide transmission into the container is substantially equal to the predetermined carbon dioxide removal rate.

In the original rejection of the claims (paper No. 9), the Examiner stated that Lovegrove et al. teaches the conventionality of providing the carbon dioxide adsorbing material in a carbon dioxide pervious bag, and further that the perviousness of the bag would inherently have to be at the rates recited for the method to reduce the carbon dioxide concentration. Clearly, Lovegrove et al. (and indeed, Bedrosian et al.) must provide the carbon dioxide adsorbent in *some* type of pervious container. However, this simply does not address the element claimed in Claims 10, 11 and 12 - that the transmissible container is selected such that the carbon dioxide transmission into the container is substantially equal to the predetermined carbon dioxide removal rate.

In the event that the Examiner maintains the rejection of these claims, Applicants request that the Examiner specifically point out where in the references this embodiment is disclosed or suggested.

Claims 25 and 26 also depend upon Claim 1, discussed hereinabove and removal of this rejection is also requested. Independent Claim 143 also includes the limitation that an amount of carbon dioxide absorbing material is placed in the chamber and in fluid communication with the chamber to absorb the difference between a predicted level of carbon dioxide in the chamber based on the rate of consumption of oxygen by the produce and a desired carbon dioxide level, so that a non-zero carbon dioxide concentration within a predetermined range is maintained in the chamber. As is discussed above with respect to Claim 1, Bedrosian et al. does not disclose or suggest adsorbing the difference between a predicted level of carbon dioxide in the chamber and a desired carbon dioxide level in the chamber. Removal of this rejection is therefore requested.

Claim 146 depends upon Claim 143 and removal of this rejection is also requested.

Independent Claim 153 recites a method wherein carbon dioxide is continuously removed from the chamber by a predetermined removal rate with an amount of carbon dioxide absorbing material, where the rate is selected such that a non-zero carbon dioxide concentration is maintained within the chamber and the concentration is within a predetermined desired range for the storage time. As is discussed above with respect to Claim 1, Bedrosian et al. does not disclose or suggest these method steps and removal of this rejection is requested.

Claim 155, 156, 157 depend upon Claim 153 and removal of the rejection with respect to these claims is also requested.

Independent Claim 160 recites a method for adjusting the atmosphere within a chamber containing respiring produce, including similar steps as those recited in Claim 1. Therefore, removal of this rejection is also requested.

It is not believed that any fees are owed with respect to this response, however any such fees can be charged to Deposit Account No. 50-1419.

Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would expedite disposition of this application, the Examiner is invited to contact Applicants' undersigned representative.

Respectfully submitted,

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